Introduction to the Physics Department (Rev. 01-2)

Note: This document is available from the Physics Department ES&H Page and as a PDF document.
Welcome to the Physics Department. The purpose of the attached information is to aid you in conducting your work in a productive, safe and environmentally sound manner. This *Introduction* includes contacts in the administrative areas as well as in the areas of Environment, Safety, and Health (ES&H). Please keep this handy and refer to it as needed.

Information about the Physics Department, including a current calendar of events, can be found on the Internet at http://www.phy.bnl.gov/. Links to other departments and events at Brookhaven National Laboratory (BNL) are provided as well.

The Physics Department is involved in a variety of projects, which are carried on at other facilities throughout the BNL site. Contacts and some procedures are provided here for the Collider Accelerator Department (AGS and RHIC facilities) and the National Synchrotron Light Source (NSLS). Please familiarize yourself with the procedures applicable to the location and type of work you do.

Michael J. Murtagh, Chair

PHYSICS DEPARTMENT RULES EVERYONE MUST KNOW

- **All individuals performing work at BNL are required to obtain a guest or permanent appointment before beginning work.**
- **Radioactive materials, chemicals, and equipment may not be brought into the Department without prior notification.**
- **General Employee Training (GET), Stop Work Training, Emergency Planning and Response Training, Environmental Protection Training, and a Department Specific Briefing are required of all employees and guests.**
- **Radiation Worker Training is required for unescorted access to Controlled Areas, Radiological Buffer Areas, Radioactive Materials Areas and Radiation Areas. *GERT only allows you to enter controlled areas unescorted.***

- **All safety training must be completed before the work that depends on that training begins.**

- **Working in a laboratory area requires additional training (HazCom or Lab Standard).**

- **Using the Machine Shops, Cranes or Forklifts requires additional training before you use them. Authorized users are posted where this equipment is located. YOU MUST BE ON THE AUTHORIZED USER LIST TO USE THE MACHINE SHOP OR OPERATE THE CRANE OR FORKLIFT.**

- **Using Cryogenics or Compressed Gases requires additional training before you use them. Electrical work also requires additional training.**

- **Using Class IIIb or Class IV Lasers requires additional training and an eye exam before you use them. Authorized Users are posted at each lab where these are used. YOU MUST BE ON THE AUTHORIZED USER LIST TO OPERATE THE LASER.**

- **The Price Anderson Act provides civil and criminal penalties for violations of radiological rules.**

- **Hazard Placards are placed outside each laboratory to inform you of the hazards in that lab. They must be kept up to date.**

- **All labs and offices should be kept locked after hours and on weekends.**

For further information contact the Safety & Training Office, Room 1-43, ext. 2585.

The First Step

All individuals performing work at BNL are required to obtain a guest or permanent appointment and take all the required training before beginning work. If you do not have an appointment, see your supervisor now about how to obtain one.

Environmental Protection

A major on-going responsibility of the Physics Department is to protect the environment. This is being accomplished through a number of initiatives such as experimental safety reviews, waste and storage minimization efforts for hazardous and non-hazardous substances, and most importantly - training. It is the responsibility of every individual in the Department to help protect the environment. Individuals must report spills or discharges of any type that can harm the environment to their line supervisor, group safety coordinator, ES&H Coordinator, Safety Office, Department Chair, or the Fire and

Rescue Group (911 or 2222) depending on the hazard level. If you are unsure of the hazard level, call one of the above for advice.

The only fluids that can be discharged into sinks are beverages, soaps for hand or dish cleaning and small quantities of Sink-Releasable Chemicals. This list is available in the Safety and Training Office, ext. 2585.

Safety Information

The policy of the Laboratory is to protect the environment while providing a safe and healthy workplace for all employees, visitors, guests, and contractors. As a new member of, guest, or visitor to, the Physics Department, you should be aware that there are safety procedures to be followed. These policies are stated in the BNL SBMS (Standards Based Management System), and the Physics Department ES&H Page. In addition, your group may have additional safety information or procedures that you should be aware of.

Safety Organization

The responsibilities of the people in the department safety organization are detailed below. The individuals currently holding these titles are listed at the end of this document.

Group Safety Coordinators

Your Group Safety Coordinator (GSC) is responsible for acting as the liaison between your group and the Department safety organization. The GSC should be your first contact for routine safety questions.

ES&H Coordinators

The Department ES&H Coordinators provide liaison between the ES&H Services and Occupational Medicine Divisions and the Department Chair. The coordinators are responsible for implementing safety policy and procedures and ensuring that the Department is in compliance with Laboratory and DOE policy as well as with county and state regulations.

The ES&H Coordinators are also responsible for managing and executing a program of Tier I safety inspections of Physics Department facilities, including offices and laboratories. Some of the objectives of these self-inspections are to maintain a safe working environment, and to recognize potential hazards and perform corrective actions before they can lead to serious incidents. Please respond promptly to any notifications of problems in your areas.

The Department Environmental Safety & Health (ES&H) Committee

The Department Environmental Safety & Health (ES&H) Committee provides assistance and advice on safety and protection of the environment. This Committee is responsible for reviewing new projects or major changes to existing projects within the Department (see ES&H Committee's Responsibilities). Group Leaders advise the ES&H Committee of new projects or potential problem areas, which could require a safety review. Group Leaders have the responsibility to inform the Committee of any hazardous equipment or chemicals prior to bringing them to the Laboratory by their collaborators. It is the responsibility of employees and guests to advise their Group Leader of the need for this equipment/chemical before bringing it on site.

Should you have any safety related questions or be uncertain as to whether your project requires review by the Department ES&H Committee, please contact your GSC, Group Leader, the Department ES&H Coordinator, or any member of the Department ES&H Committee.

Smoking Policy

SMOKING IS PROHIBITED IN ALL LABORATORY BUILDINGS AND VEHICLES. The only exceptions are the residential units and the smoking section of the Brookhaven Center Club.

Personal Protective Equipment

Your work may require safety shoes, glasses, lab coats, hardhats, etc. Use of personal protective equipment, when required, is not optional.

A voucher for safety shoes and glasses can be obtained from the Department Safety and Training Office. You must provide an account number for payment. The office also stocks some other safety equipment.

Quality Assurance

Experimental work in the Physics Department involves all aspects of the Quality Assurance (QA) Program. The QA responsibilities of managers of Department activities, (i.e. group leaders, experiment spokespeople, chief engineers) consist primarily of determining what QA procedures apply and maintaining documentation on the execution of those procedures. . The Department Designated Quality Assurance Representative (DQAR) provides assistance with QA related issues.

Activity Sheets & Experiment Safety Review

The Department is required to evaluate all experimental activities conducted under BNL auspices for safety and environmental hazards before the project is allowed to begin. Check with your Group Leader, Group Safety Coordinator or the Department ES&H Coordinator to determine if a new review is needed for your project. Experimental Safety

Review Forms should be submitted to the ES&H Coordinator electronically. See the Department's Experimental Safety Review Policy and Procedures for more details.

Experimental Safety Review takes time! To avoid delay in your project, inform the ES&H Coordinator of your plans well in advance.

Minors/Children

Unsupervised Minors/Children are not allowed in Physics Department areas.

Work by minors (those under 18) must be specifically approved by the Department Chair. Contact the Department Safety and Training Office for more information.

Minors/children are not allowed in radiologically Controlled Areas, machine shops, or any other area with significant hazards except with explicit approval from the Department Chair. Other approvals may be necessary as well. See the Department Safety and Training Office for additional information.

Department Safety and Training Office

Rooms 1-43 and 1-45 are the Department Safety and Training Offices. You can come to the office or call x2585 if you have a question about training, safety or require help with a safety problem. Computer based training is available in this office, specifically, the Radiation Worker I Challenge Exam and all BNL web based training courses.

Training

You are required to attend all training applicable to your work at the Laboratory. All BNL employees and guests are required to attend General Employees Training (GET), Stop Work Training, Emergency Planning and Response Training, Environmental Protection Training. A Department Specific Briefing, given by the Department ES&H Coordinator is required of all Physics Department employees and guests. Hazard Communication Training (HazCom) is required for all Physics Department employees and guest whose work is not strictly confined to offices. Hazard Communication Training is also required for employees and guests of other departments who work in laboratories and shops in Building 510. Other training requirements are set by your supervisor based on your job responsibilities. Specific BNL Certification is required for operation of cranes, forklifts and machine shop equipment. Class IIIB and IV laser work requires specific training and an eye examination. Using compressed gasses, cryogenics, and some electrical work requires specific training. The Department Training Coordinator or the Safety and Training Office (Rm. 1-43) can provide you with additional information about training.

You can access your training record in the Training Database. You can see a schedule and register for courses at the Training Home Page. Some training courses are available as Web-based training courses.

Chemical Information You Should Know

?? BNL maintains a site-wide chemical inventory in the BNL Chemical Management System (CMS). The CMS is your link to the Material Safety Data Sheets (MSDSs) that are available for all materials used at the Laboratory. Learn to use the CMS as your first source of chemical information.

?? Chemicals are not available in the Physics Department stockroom. You must order your own chemicals when you need them through the Physics Stockroom, from Supply and Materiel (x7991), or using the Web Requisition System. When the chemicals arrive they must be picked up that day.

?? **Chemicals cannot be purchased with a BNL credit card**. All chemicals ordered through BNL are bar coded on arrival. Chemicals are sometimes available free of charge from the CMS chemical exchange.

?? You must notify the Department Safety Office ***before*** you bring chemicals or hazardous materials on site so that your plans to use them can be reviewed and the container bar coded.

?? **If you transfer ownership of or move a bar coded chemical container to another location, you must fill out a** Chemical Transfer Sheet.

?? Any laboratory use of chemicals requires the user to take IND 200, Hazard Communication or IND 220, Laboratory Standard. Hazardous Waste Generator training is required for use of hazardous chemicals.

?? Use of carcinogens requires the user to take IND 220 Laboratory Standard.

?? The custodian of a multipurpose chemical cabinet must take IND 220, Laboratory Standard and be familiar with the list of Incompatible Chemicals.

?? Chemicals ***must be*** disposed of properly since they can damage the environment. If you are not sure what to do, look for guidance from the "How do I manage this waste stream?" web page. An unofficial list of OSHA Regulated Chemicals is available on the web.

?? **When you empty a bar-coded container, or get rid of it as hazardous waste, you must remove the bar code and affix it to a** Bar Code Removal Sheet.

Radiological Information

It is of primary importance that radiological regulations are followed TO THE LETTER. Radiological regulations are federal laws; BNL is responsible for keeping track of all infractions. Serious single violations or repeated minor violations have resulted in substantial fines being paid by BNL. Individuals responsible for serious, willful violations have been barred from site.

Price Anderson Amendments Act (PAAA)

It is important to make you aware of the absolute requirement to follow all radiation safety rules at BNL facilities. Federal law (PAAA) provides for criminal and monetary penalties if you do not follow the rules fully. Persons have been the subjects of criminal investigations when found to willfully remove a radiation barrier. Thus, we request that you pay particular attention to the radiation safety rules.

The Price-Anderson Act sets up a regulatory scheme for enforcement of radiation safety rules, including radiation protection standards (10 CFR 835). Failure to comply with those rules, or to identify and report non-compliance to DOE, subjects the Laboratory (not a User) to an enforcement action. This could include a legal Notice of Violation and a civil penalty up to $100,000 per violation.

When signing documents related to radiation safety, a person is essentially confirming that he/she has done his/her assigned project according to the rules. The signature does not mean that the person is guaranteeing that the project will be carried out perfectly or that there is no potential for a violation. It does mean that the person is performing his/her duties to the best of their ability and has made a good faith effort to comply with the radiation safety rules. A "good faith effort to comply with the rules" means that the person has familiarized him/herself with the requirements of regulations that fall within his/her area of responsibility. Having done so, he/she should he in a position to approve/sign off on procedures or training to carry out work involving radiation safety.

WARNING

It should be understood that any person who intentionally violates any radiological regulation, regardless of whether the person signs any document related to compliance, can be subject to criminal prosecution or other disciplinary action.

Entering Radiological Areas

To enter an area with yellow and magenta radiological signs you must have the appropriate BNL radiological training or someone with that training must continuously escort you. The Physics Department requires Radiological Worker I Training for all those who work with sources or radioactive materials in Building 510. General Employee

Radiation Training (GERT) is not sufficient. (Note: GERT is not the same as nor can it satisfy the GET, General Employee Training requirement of the Laboratory).

Thermoluminescent Dosimeters, TLDs, (radiation badges) are required for entry into areas marked "TLD required". The RCD Services Representative/Technician can issue you a badge in Building 510 after you complete Radiological Worker I Training and provide an account number.

The Department is required to maintain an inventory of radioactive sources. Notify the Department Safety and Training Office or the ES&H Services Technician/Representative before bringing any source into the department.

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Rules for Working with Radioactive Sources in the Physics Department

?? All sources must be under the control of a TRAINED Source Custodian (All Groups owning sources must have a trained Source Custodian).

?? You are required to stay within the Administrative Control Limits established by the Physics Department (100 mRem/yr).

?? All sources must be inventoried and tracked with the source inventory physically verified semiannually (by the source custodian) & reported to the ES&H Coordinator.

?? Sources may only be purchased after signoff by the ES&H Coordinator.

?? A source can only be in an appropriately posted area and must have a Radioactive Source or Radioactive Material Tag with it at all times. Wear a TLD badge when using any source, follow posting rules, and sign the source out/in of the source box when removing/returning it.

?? Notify RCD Technician for posting before moving a source into another area or before moving a source into or out of a building. A Radiation Worker Permit (RWP) is required for the use of strong sources (potential for > 100 mRem/yr.). In addition, other sources that are in specially designed rigs may not be taken apart and used without contacting RCD Technician since exposures can be considerably higher and a RWP may be needed.

?? Immediately report to RCD Technician or Department Safety and Training Office, sources found which are not inventoried (NO TAG) or are in unposted areas.

Basic ALARA Principles That Apply to Everyone at BNL

Radiation Exposure Must:

- ? Have A Net Benefit (there has to be a good reason for ***any*** exposures)
- ? Be **A**s **L**ow **A**s **R**easonably **A**chievable (**ALARA**)
- ? Be Within Limits

There is no benefit from radioactive jewelry, tools, eating, or drinking in radiation areas.

The Physics Department is monitoring the individual dose for each employee, guest, and visitor and will look to work with those who receive appreciable exposures in order to review the work being done in an effort to reduce exposure.

Experimental Safety Reviews and Radiation Work Permits are ways that the work in Radiation Areas and work around radioactive materials is reviewed. Make sure your project is reviewed before you begin and that you follow all radiological rules, regulations, and postings.

Individuals should not be using a source if they don't know what it is and what the hazards of that source are. Don't rely on the word of someone else. Radiation Worker Training describes the types of ionizing radiation and the hazards associated with each type.

If you have any questions on radiological regulations or radiation dose rates, or if you wish to be certain that a task is being conducted in a manner to assure that **A**s **L**ow **A**s **R**easonably **A**chievable (ALARA) Guidelines are maintained, contact the ALARA Coordinator.

New RWP Form Effective August 1, 1999.

EMERGENCY PROCEDURES

SITE-WIDE

Should an emergency at the Laboratory occur requiring site wide evacuation the following emergency evacuation procedures are to be followed:

Site Alert Continuous Siren: Continuous sounding of the BNL siren for 5 minutes calls for all non-emergency personnel to report to the designated Assembly Area and await further instructions. (Note: The laboratory tests the site sirens every Monday at 12 Noon.)

Evacuation Intermittent Siren: Intermittent sounding of the BNL siren for 5 minutes signals that all employees shall evacuate the Laboratory site immediately.

BUILDING

An emergency in Building 510 is indicated by the sounding of the fire alarm bells. If you are working at another Facility, familiarize yourself with local emergency procedures for that facility.

Fire Evacuation Signal: Continuous or intermittent ringing of bell. Immediately leave the building by the nearest exit.

INFORMATION

BUILDING 510:

Assembly Area: Building 510, Large Seminar Room (Auditorium).

Shelter in Place Area: Building 510, Basement.

Outdoor assembly Area: Building 510, Front Lawn.

Evacuation Zone: Zone 5.

Local Emergency Coordinator: Ron Gill, x3987

Local Emergency Plan (PDF Document).

Route to Shelter in Place Area.

Shelter in Place Area.

BUILDING 118:

Assembly Area: Building 510, Large Seminar Room (Auditorium).

Shelter in Place Area: Building 510, Basement.

Outdoor assembly Area: Building 510, Front Lawn.

Evacuation Zone: Zone 5.

Local Emergency Coordinator: Ron Gill, x3987

Abbreviated Local Emergency Plan (PDF Document).

BUILDING 832:

Assembly Area: Building 830, Lobby

Shelter in Place Area: **Building 830, Lobby.**

Outdoor assembly Area: **Building 832, Front Lawn.**

Evacuation Zone: **Zone 10.**

Local Emergency Coordinator: **Tom Muller, x4507**

Abbreviated Local Emergency Plan (PDF Document).

Occurrence Reporting

BNL is required by DOE regulation to report occurrences that have an adverse impact on the safety or environment of our workplace and events that result in significant damage, property loss, or downtime. This requires you, as an employee, to report such occurrences to your supervisor, Department management or ES&H Services **within 2 hours of the event.** This also applies to weekends and holidays. More information is listed in the Physics Department Policy on Nonconformance and Corrective and Preventative Actions.

As a rule of thumb, you should immediately report to your supervisor or to department management any significant event. These events could include injury, accident, breach of rules, significant equipment malfunction, loss or damage.

All staff are required to appropriately report abnormal events or conditions that they perceive may

- endanger the health and safety of staff or the public,
- have an adverse effect on the environment,
- seriously impact the operations and intended purpose of BNL facilities,
- result in loss or damage of property, or
- adversely affect national security or the security interest of DOE or BNL.

When an abnormal event or condition is reported to a Department Chair/Division Manager, it is subsequently relayed to an Occurrence Categorizer who determines if the event or condition meets the criteria for a reportable occurrence. The Occurrence Category drives a graded approach to the level of follow-up actions required for internal and external notifications, occurrence investigation and analysis, and occurrence reporting. After a reportable occurrence is categorized and appropriate notifications are made, it is evaluated to assess its significance and programmatic impact, causal factors, generic implications, and the need for and implementation of corrective actions. The information identified in this process forms the basis for the Final Occurrence Report. This information also assists in improving policies and procedures and communicating lessons learned.

Moving into Physics Department Areas

All Areas

1. If the previous occupant has left behind anything that might be a safety hazard (chemicals, radioactive materials) or if you see a safety problem you should inform your Group Safety Coordinator or the Department Safety Office (1-43, ext. 2585) immediately.
2. Leave a clear egress path a minimum of 28" wide from all areas.
3. Building 510 has no sprinkler system. Do not accumulate empty boxes, large quantities of loose paper or other combustible materials outside of closed cabinets.
4. Do not store heavy items on overhead shelves.
5. Food and drink must be stored, prepared and consumed in areas free of hazardous materials (chemicals, solder, etc).
6. Empty food and beverage packaging attracts bugs. Do not accumulate these items.
7. Do not store or consume alcoholic beverages.
8. Heating appliances (coffee pots, warmers, hot plates, space heaters) must be kept away from combustible materials when plugged in.
9. Space heaters must be UL Listed and have a 'tip-over' shutoff switch.
10. Extension cords are not allowed except for temporary set-ups. They must be Type S.
11. Practice good housekeeping habits in all areas.
12. Report problems with insect or vermin infestation or any other condition not in compliance with ES&H Standard 2.6.0 to the Building Manager, ext. 2281.
13. Avoid storage or eating of food in areas where toxic materials are present.
14. Use proper facilities for the cleaning of cups, utensils, etc.

Offices

1. Small quantities of chemicals with no significant hazards (e.g., a pint of isopropyl alcohol) are allowed, but you cannot use your office as a chemical storage area.
2. You are not allowed to have any radioactive materials or sources in your office.
3. Using offices to store significant amounts of lab equipment is discouraged.
4. Offices cannot be used as laboratories.

Laboratories

1. Leave clear areas in front of closets, utility access panels, fire extinguishers and electrical panels and breakers to allow free access.
2. Update the information on the green hazard placard and notify the Safety and Training Office (Rm. 1-43 phone ext. 2585) of the update. This placard is used by police, fire, etc. to notify you of any event in the room that might require your immediate attention (fire or water damage to your equipment, theft, vandalism,

etc). **Therefore, the first name on the placard should be someone based at BNL.**

If you want to move furniture from room to room you must contact the Building Manager. YOU ARE NOT ALLOWED TO MOVE IT YOURSELF.

All rooms should be kept locked when not in use, in particular, after hours and on weekends.

Work at Other Facilities

Personnel working in other facilities (NSLS, AGS, RHIC) must abide by the specific safety and training requirements for those facilities. You must make sure that you have completed any requirements BEFORE you begin work at another facility. The information given below is intended to provide you with the appropriate contacts – it is not a complete listing of requirements.

You must complete safety review of equipment and activities for each department where the equipment will be used and the activity will take place. If you move lasers, sources, lifting equipment, chemicals or any other items with significant safety hazards between departments, **you are responsible for notifying relevant departments in advance so that they can perform an appropriate review.**

COLLIDER-ACCELERATOR DEPARTMENT

The current version of "C-A ESH REQUIREMENTS BRIEFING FOR USERS", summarizes safety and training requirements for work at the Alternating Gradient Synchrotron (AGS) or the Relativistic Heavy Ion Collider (RHIC). A person working at the AGS **must** attend AGS User Training or pass a challenge exam before each running period and **must** have valid Radiological Worker 1 Training. Those working at RHIC must attend Collider User Training.

NATIONAL SYNCHROTRON LIGHT SOURCE (NSLS)

Several groups in the Physics Department operate instruments at the NSLS (Bldg. 725) as well as in the Physics building (Bldg.510). The current version of the NSLS Users Guide gives a detailed description of the facility and the general services available to you. If you are going to be using this facility please obtain a copy of this manual from the NSLS User Administration Office, Building 725B, Rm. 2-100, Ext. 7976.

Physics Department Contacts:

Physics Department Directory

Physics Department ES&H Committee

Physics Department Group Safety Coordinators